

## Evaluates: MAX22199

## MAX22199 Evaluation Kit

### General Description

The MAX22199 evaluation kit (EV kit) provides the hardware and software necessary to evaluate the MAX22199 Octal Industrial Digital Input device. The MAX22199 EV kit receives commands from a PC through the USB port to create a SPI interface for communication between the software and the MAX22199 on the EV kit. The MAX22199 EV kit also has a Pmod™ compatible connector for SPI communication with an external host device such as a MCU or FPGA.

The EV kit includes a graphical user interface (GUI) that provides communication between the target device and the PC. The MAX22199 EV kit has a MAX22199 device that supports Type 1, 3 inputs with the current sink limit set by an on-board resistor. The MAX22199 EV kit is designed to support transient immunity testing for ESD, EFT, and Surge according to IEC 61000-4-2, IEC 61000-61000-4-4, and IEC 61000-4-5 respectively. The EV kit can operate in multiple modes, as shown in the [System Block Diagram](#):

- 1) USB Mode: If SW1 are all closed, the MAX22199 SPI receives commands through the USB port from the Maxim-supplied EV kit software.
- 2) Pmod Mode: If SW1 are all open, the MAX22199 SPI receives commands through the PMOD1 connector. This industry standard connector connects to popular MCU or FPGA platforms. The user is required to generate firmware to provide the SPI commands.

### EV Kit Contents

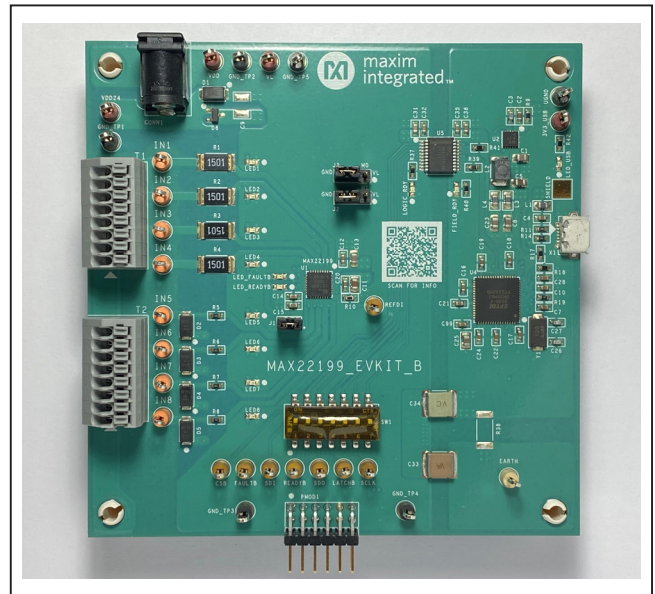
- MAX22199EVKIT#, including the MAX22199ATJ+
- Micro-USB Cable

[Ordering Information](#) appears at end of data sheet.

### Features

- Easy Evaluation of the MAX22199
- EV Kit Logic Side is USB-Powered
- Configured for IEC 61131-2 Type 1, 3
- Galvanic Isolation using MAX14483
- Supports Transient Immunity Testing to IEC 61000-4-2, IEC 61000-4-4, and IEC 61000-4-5
- Robust Design ±2kV Surge Tolerant Line-to-Ground and Line-to-Line, ±8kV Contact ESD, and ±15kV Air-Gap ESD at field inputs
- Windows® 10 Compatible Software
- Fully Assembled and Tested
- Proven PCB Layout
- RoHS Compliant

### MAX22199 EV Kit

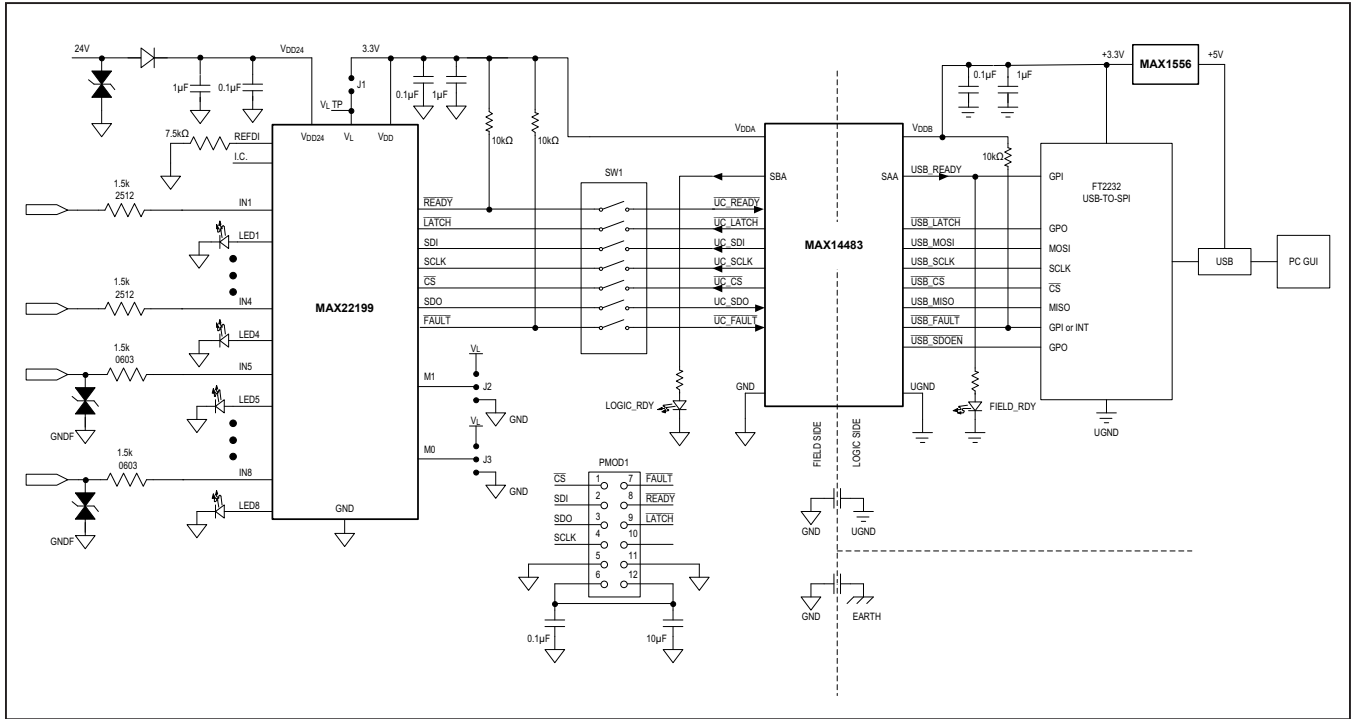


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Pmod is a trademark of Digilent, Inc

319-100819; Rev 0; 10/21

System Block Diagram



MAX22199 EV Kit Files

FILE	DESCRIPTION
MAX22199EVKitSetupV1.00.exe	Application Program

## Quick Start

### Required Equipment

- MAX22199 EV kit
- Micro-USB cable
- 24V DC voltage supply (or 24V AC-DC adapter with barrel connector)
- Windows 10, Windows 8.1, Windows 7, Windows XP PC with a spare USB port

**Note:** In the following sections, software-related items are identified by bolding. Text in **bold** refers to items directly from the EV kit software. Text in **bold and underline** refers to items from the Windows operating system.

### Procedure

The EV kit is fully assembled and tested. The default jumper settings configure the EV kit to operate in USB mode. In this configuration, the EV kit's "logic side" is powered by +5V from the X1 USB connector, the "field side" is powered by the external DC supply connected to the VDD24 and GND test points, and the MAX22199 is configured in SPI mode 0. U1 is configured for eight Type 1 or Type 3 inputs (terminal blocks T1 and T2). Follow the steps to verify the MAX22199 operation:

- 1) Verify that all jumper settings are in the default position from [Table 1](#).
- 2) For initial testing, the MAX22199 EV kit is powered from USB (+5V) from the USB connector and 24V at the VDD24 and GND test points.
- 3) Visit [www.maximintegrated.com](http://www.maximintegrated.com) to download the latest version of the EV kit software, MAX22199EVKit-SetupV1.00.exe.
- 4) Install the EV kit software and USB driver on your computer by running the MAX22199EVKitSetupV1.00.exe program. A message box asking "Do you want to allow the following program to make changes to this computer?" might appear. If so, click "Yes".
- 5) The program files are copied to your PC and icons are created in the Windows **Start | Programs** menu. At the end of the installation process, the installer launches the installation for the .NET framework 4.0 and FTDI Chip CDM drivers.
- 6) The installer includes the drivers for the hardware and software. Follow the instructions on the installer and once complete, click **Finish**. The default location of the software is in the program files directory.
- 7) Connect the MAX22199 EV kit USB connector X1 to the PC with the micro-USB cable. Windows should automatically recognize the device and display a message near the **System Icon** menu indicating that the hardware is ready to use.
- 8) Connect the DC power supply between the EV kit's VDD24 and GND\_TP1 test points. Set the DC power supply output to 24V, and then enable the output. On the EV kit, observe that the LED\_USB, LOGIC\_RDY, FIELD\_RDY, LED\_FAULTB, and LED\_READYB LEDs are on, indicating that the EV kit is powered up.
- 9) Once the hardware is ready to use, launch the EV kit software by opening its icon in the **Start | Programs** menu. The EV kit software appears as shown in [Figure 1](#).
- 10) Verify that the lower-right status bar indicates the EV kit hardware is **Connected**. If the status bar indicates **Disconnected**, click **Connect to Hardware** from the **Device** menu. Next, select a device in the list or use the default device already selected.
- 11) Click the **Clear POR** button. Observe that **POR** status light for U1 is changed to green, and **FAULTB Signal** status light is also changed to green in the **Configuration** tab as shown in [Figure 2](#).
- 12) Observe that LED\_FAULTB on the EV kit is turned off.
- 13) Click **Read DI Continuously** button. The EV kit software reads the U1 registers continuously. Connect the 24V DC voltage to one of the input test points, e.g., test point IN5. The corresponding **Digital Inputs** status light **IN5** is changed to green from yellow to indicate U1 channel IN5 is high as shown in [Figure 3](#).

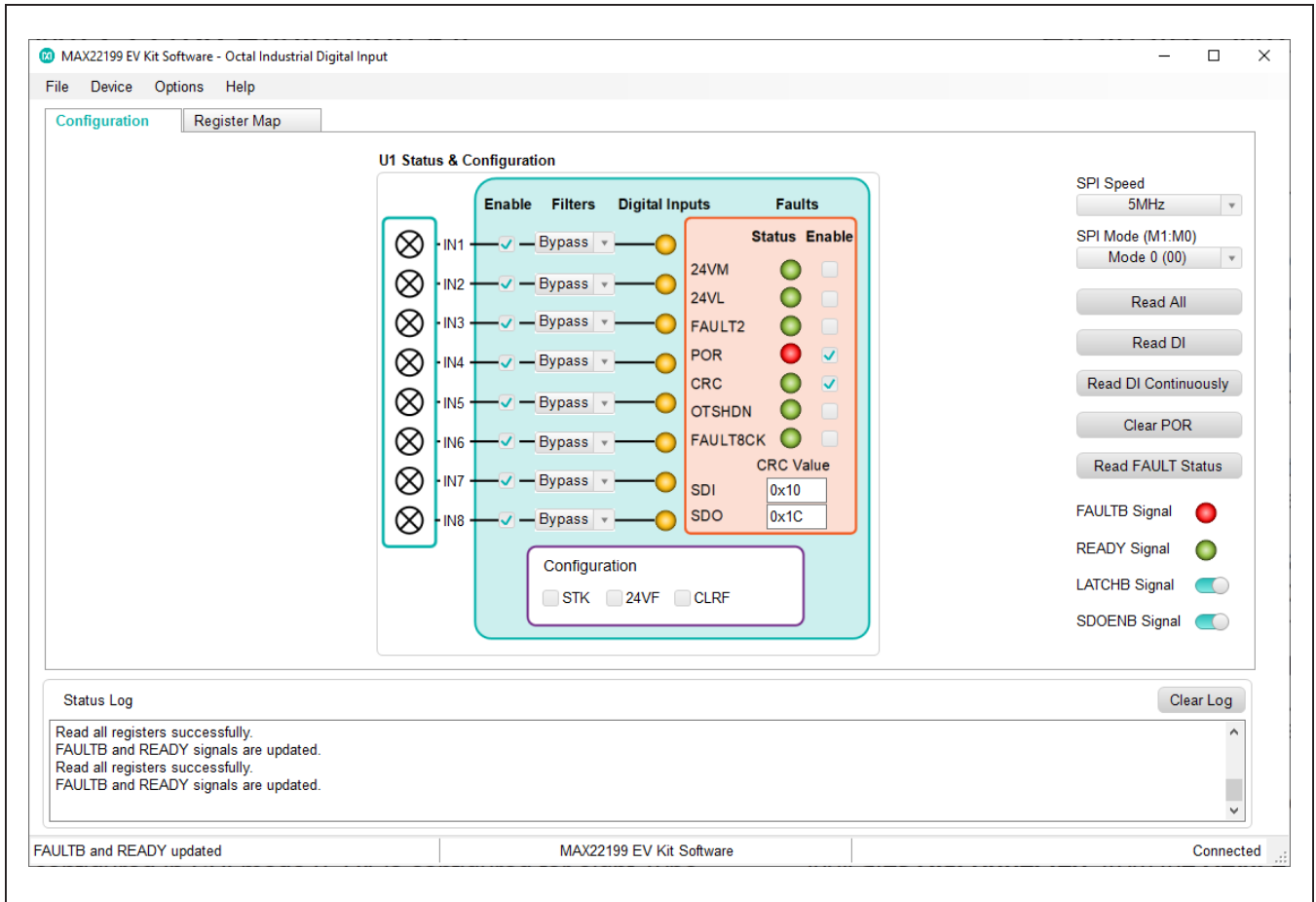


Figure 1. MAX22199 EV Kit Software Startup Window

Table 1. MAX22199 EV Kit Jumper Settings

JUMPER	SHUNT POSITION	DEVICE	DESCRIPTION
<b>POWER</b>			
J1	1–2*	U1	Connect U1 V <sub>DD</sub> supply to U1 V <sub>L</sub> supply
	Open		Connect external power supply from VL test point to U1 V <sub>L</sub> supply
<b>SPI</b>			
J2	1–2	U1	U1 SPI Mode M1 = 1
	2–3*		U1 SPI Mode M1 = 0
J3	1–2	U1	U1 SPI Mode M0 = 1
	2–3*		U1 SPI Mode M0 = 0
<b>TEST POINTS</b>			
VDD24	Field-side 24V supply		
VDD	Field-side V <sub>DD</sub> (3.3V) supply		
VL	Field-side V <sub>L</sub> logic supply		
GND_TP1 – GND_TP5	Field-side ground		
3V3_USB	Logic-side (3.3V) supply		
EARTH	Protected Earth Connection to the EV kit		
UGND	Logic-side ground		
IN1 – IN8	Field-side digital inputs for U1 IN1 to IN8		
CSB	U1 chip-select $\overline{CS}$		
SDI	U1 serial data input MOSI		
SDO	U1 serial data output MISO		
SCLK	U1 serial clock SCLK		
LATCHB	U1 LATCH signal		
FAULTB	U1 FAULT signal		
READYB	U1 READY signal		
REFDI	U1 REFDI signal		

\*Default position.

### Detailed Description of Software

When the MAX22199 EV kit software starts, it automatically detects if the EV kit is connected to a PC and indicates its status in the status bar at the bottom edge of the GUI. If the software does not recognize the EV kit board, make sure that the software and all drivers are properly installed, check the USB connection, and go to the **Device** menu and select the **Search for Hardware** option. When the EV kit is properly connected, the MAX22199 device (U1) is read and all controls are updated (see [Figure 1](#)).

The main window of the EV kit software contains two groups of controls: **U1 Status & Configuration**, and general controls for the EV kit. The **U1 Status and Configuration** pane provides the controls to directly con-

figure MAX22199 features such as reading digital inputs, input filters configuration, fault status reporting, etc. The general controls for the EV kit allow the user to select the SCLK speed, MAX22199 SPI mode, LATCH signal level, etc. Next to the **Configuration** tab, the **Register Map** tab lists all registers in the MAX22199 and provides direct read and write access to all control bits.

If the MAX22199EVKIT# hardware is not connected automatically, the **Device** menu provides the functionality to connect to or disconnect from the hardware by choosing detected EV kit serial numbers. Under the **Options** menu, a **CRC Calculator** ([Figure 4](#)) is provided to calculate the 5-bit CRC code based on the data frame provided by the user. The jumper positions are shown in the **Jumper Setting Diagram** ([Figure 5](#)) under the **Options** menu based on selectable SPI mode.

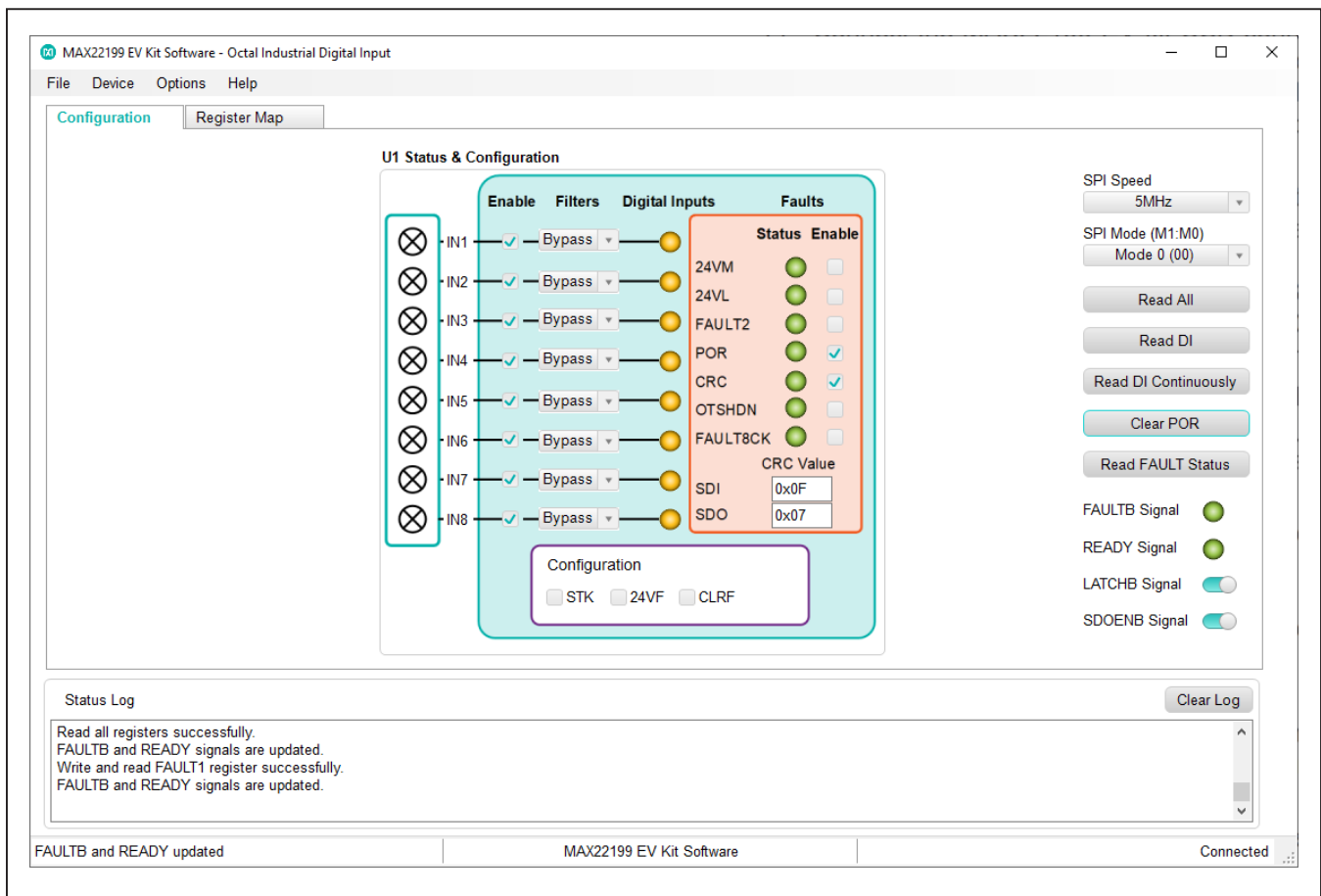


Figure 2. MAX22199 EV Kit Software—Clear POR

### Configuration Tab

The **Configuration** tab provides an interface for configuring the MAX22199 from a functional perspective. Before sending the commands to the MAX22199, select the desired SPI mode and configure the jumpers according to the [Table 1](#). The status and configuration box provides the controls for digital inputs reading, DI channel enable, fault status reporting,  $\overline{\text{FAULT}}$  pin configuration, input filters configuration, CRC value calculation, etc.

After power up, the MAX22199  $\overline{\text{FAULT}}$  pin is low and the POR bit in the FAULT1 register is set, indicating that a power-on-reset has occurred and all registers are set to

default ([Figure 1](#)). After clicking the **Clear POR** button, the software clears the POR bit in the FAULT1 register. The  $\overline{\text{FAULT}}$  pin is pulled high and FAULTB LED on the EV kit is turned off after clearing the POR ([Figure 2](#)).

The **Read All** button reads the MAX22199 registers and refreshes all the controls with current setting. The **Read DI** and **Read DI Continuously** buttons read the values of the DI and FAULT1 registers and update the corresponding controls. The **Read FAULT Status** button reads the FAULT1 and FAULT2 registers, polls  $\overline{\text{FAULT}}$  and SAA status from the MAX14483, and updates the corresponding controls.

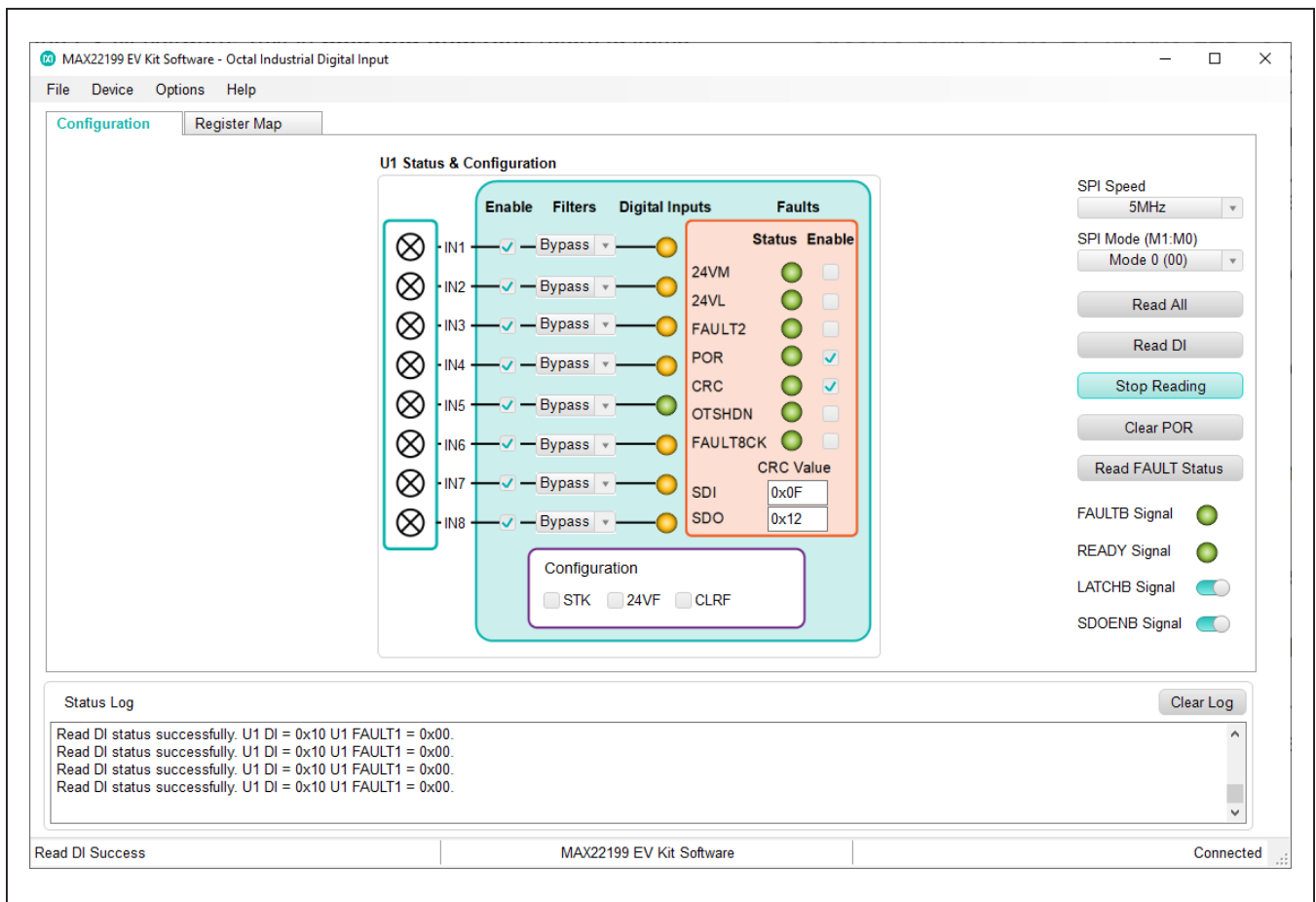


Figure 3. MAX22199 EV Kit Software—Read DI Continuously



### CRC Calculator

Clicking **CRC Calculator** under the **Options** menu opens the CRC calculation window ([Figure 4](#)). The software calculates the 5-bit CRC code based on the 19-bit data or 24-bit data (5 LSB bits are ignored) and displays the result.

### Jumper Setting Diagram

Clicking **Jumper Setting Diagram** under the **Options** menu opens the jumper setting window ([Figure 5](#)). The software displays the jumper positions based on the current SPI mode in the top silkscreen diagram. Changing the SPI mode updates the shunt positions in the diagram. The daisy-chain mode (SPI mode 2 and 3) requires two MAX22199 EV kits. The MAX22199 on the second EV kit needs to be connected to the MAX22199 on the first EV kit in daisy-chain mode and disconnected from the isolator on the second board.

### Register Map

The **Register Map** tab shows all MAX22199 registers information including the register name, address, value, read or write accessibility, and the register description. The **Value** cell can be changed by user if the register is writable. Pressing the **Enter** key after changing the **Value** writes to the register. When a certain register is highlighted in the register list, the bits' information in this register are displayed in the **Bits Description** table. The bit **Setting** is configurable if the bit is writable, which triggers a write operation to its register.

Clicking the **Read All** button reads all registers and refreshes the window with current register values. Clicking the **Write All** button writes the current settings to all registers.

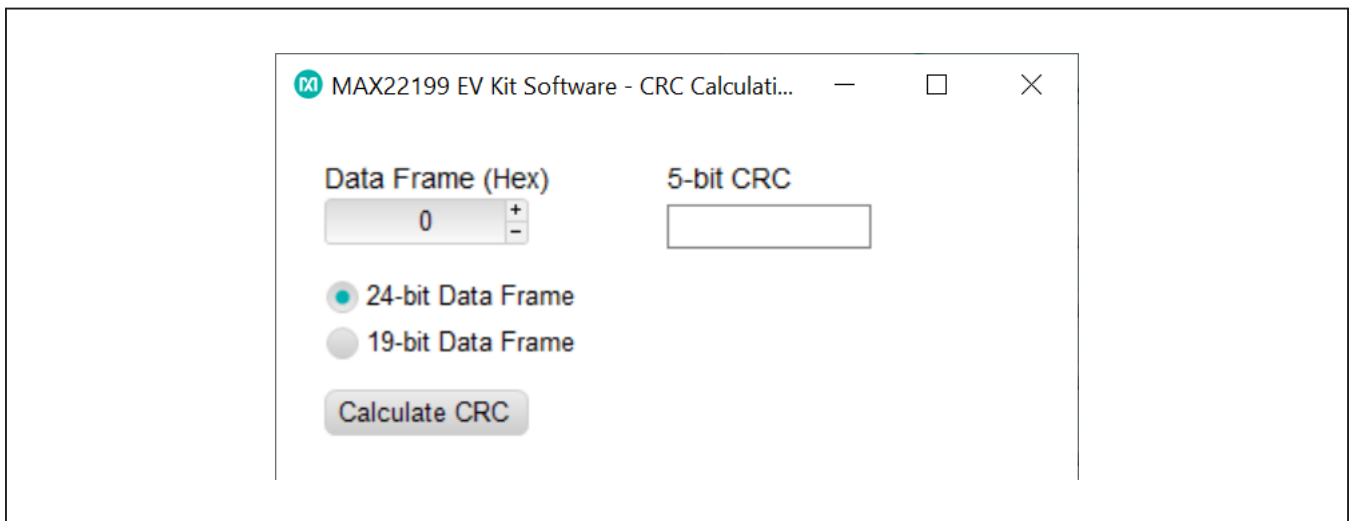


Figure 4. MAX22199 EV Kit Software—CRC Calculator





## Detailed Description of Hardware

The MAX22199 EV kit provides a proven layout for an 8-channel galvanically isolated digital input solution using the MAX22199 and the MAX14483.

### SPI Interface

The EV kit software communicates over USB to the SPI interface and supports full 10MHz clock rate for the MAX22199. The EV kit includes a standard Pmod-compatible 12-pin header to connect to an external adapter board (MCU or FPGA). If the user wants to interface to their own microcontroller or FPGA, simply connect to the Pmod connector PMOD1, open all SW1 switches, and provide the user-supplied firmware.

### READY Signal

The MAX22199  $\overline{\text{READY}}$  signal is an open-drain active-low output.  $\overline{\text{READY}}$  going low indicates that the MAX22199 is powered up and ready for operation. The  $\overline{\text{READY}}$  output from U1 is connected directly to the MAX14483  $\overline{\text{IRDY}}$  input. When the  $\overline{\text{READY}}$  signal is low, the  $\overline{\text{IRDY}}$  signal is low, and if the MAX14483 is powered up normally, the SAA signal on the logic-side is high and notifies the microcontroller that the field-side is ready for operation. The SAA signal is low when the  $\overline{\text{READY}}$  signal is high. A pullup resistor is required on the  $\overline{\text{READY}}$  pin of the MAX22199.

### Power Supplies

The EV kit has two power domains, the “logic side” which is powered from USB supplied power (3V3\_USB and UGND), and the “field side” which is typically powered from an external 24V DC supply connected to the VDD24 and GND test points. A MAX1556 DC-DC converter converts the 5V USB supply to a regulated 3.3V (3V3\_USB) supply, which powers the EV kit logic side. The MAX22199 has integrated regulator to provide low voltage output  $V_{\text{DD}}$  (3.3V, nominal), which is used to set the

SPI logic interface level ( $V_{\text{L}}$ ) and to power the field side of the digital isolator if J1 is in 1–2 position (see [Table 1](#)).

Alternatively, if an external 24V supply is not available, the field side can be powered using an external 3.0V to 5.5V supply through the  $V_{\text{DD}}$  pin of the MAX22199 and leaving the  $V_{\text{DD}24}$  pin unconnected. In this case, connect an external 3.0V to 5.5V supply to VDD and GND test points with VDD24 test point unconnected (see [Table 1](#) for test points).

In the case that an external microcontroller is used for the PMOD1 connector (SW1 contacts all open), the logic supply ( $V_{\text{L}}$ ) of the MAX22199 is provided by an external microcontroller supply. Remove jumper J1 (see [Table 1](#)), connect a 3.0V to 5.5V external supply to pins 6 and 12 on connector PMOD1, and populate R20 with a 0 $\Omega$  resistor.

### Type 1, 3 Inputs and Surge Protection

The MAX22199 senses the state (high or low) of eight digital inputs. U1 is designed to support the trip points (voltage and current) to satisfy the requirements of IEC 61131-2 Type 1 and Type 3 inputs. Resistor R10 sets the current limit value at 2.35mA (typ) and input resistors R1–R8 set the voltage threshold to ensure compliance. The input resistors R1–R4 are 1.5k $\Omega$ , 1.5W pulse withstanding thick film 2512 resistors to support IEC 61000-4-5 Surge Tolerance at  $\pm 2$ kV line-to-ground without the requirements for an external TVS diode on each input. The input resistors R5–R8 are 1.5k $\Omega$ , 0.1W 0603 resistors with a SMAJ33CA TVS diode (D2–D5) on each field input to support IEC 61000-4-5 Surge Tolerance at  $\pm 1$ kV line-to-ground. Channel 1–4 and Channel 5–8 demonstrate two options for surge protection on the MAX22199 field inputs. A separate LED (LED1–LED8) for each input port indicates the status of each input.

**Galvanic Isolation**

The MAX22199 EV kit uses a digital isolator to provide galvanic isolation between the logic and field sides. The MAX14483 is a 6-channel digital isolator, providing a single-chip solution when interfacing to a MAX22199. The isolator has two power supplies ( $V_{DDA}$  and  $V_{DDB}$ ) which operate between 1.71V to 5.5V and provide voltage translation as well as galvanic isolation. The “logic side”  $V_{DDB}$  of the isolator is powered from 3V3\_USB and UGND while the “field side”  $V_{DDA}$  of the isolator is powered from  $V_L$  and GND. When testing isolation performance, care should be taken not to have a multi-channel oscilloscope ground connection to both GND and UGND.

Protective Earth is provided on the lower-right corner of the EV kit with safety rated Y capacitors between field ground (GND) and Earth (C33), and between field ground (GND) and logic ground (UGND) (C34) to improve the high-voltage, fast transient performance.

**IEC 61000-4 Transient Immunity Compliance**

The typical application for the MAX22199 requires it to pass basic transient immunity standards as defined by IEC 61000-4-x, covering -2 for Electrostatic Discharge (ESD), -4 for Electrical Fast Transient/Burst (EFT), and -5 for Surge Immunity. The MAX22199 EV kit includes circuitry to support testing to these standards to support  $\pm 2$ kV line-to-ground and line-to-line surge,  $\pm 8$ kV contact ESD, and  $\pm 15$ kV air-gap ESD at the field input. TVS diode (D1) provides protection from surge and ESD voltages applied through the VDD24 test point. Diode D6 blocks the reverse current at the  $V_{DD24}$  pin of the MAX22199 during negative surges. To achieve the best surge performance on the field input, place a minimum 1k $\Omega$  pulse-withstanding resistor between the field input and the device input pin. C33 is a 3300pF safety rated Y capacitor placed between Protective Earth (PE) and field ground (GND) to improve transient immunity (EFT). C34 is a 1000pF safety rated Y capacitor connected between the field ground (GND) and logic ground (UGND) across the isolation barrier. For systems where PE and UGND are bonded together, the user can install the resistor R38.

**Ordering Information**

PART	TYPE
MAX22199EVKIT#	EV KIT

#Denotes RoHS compliant.

MAX22199 EV Kit Bill of Materials

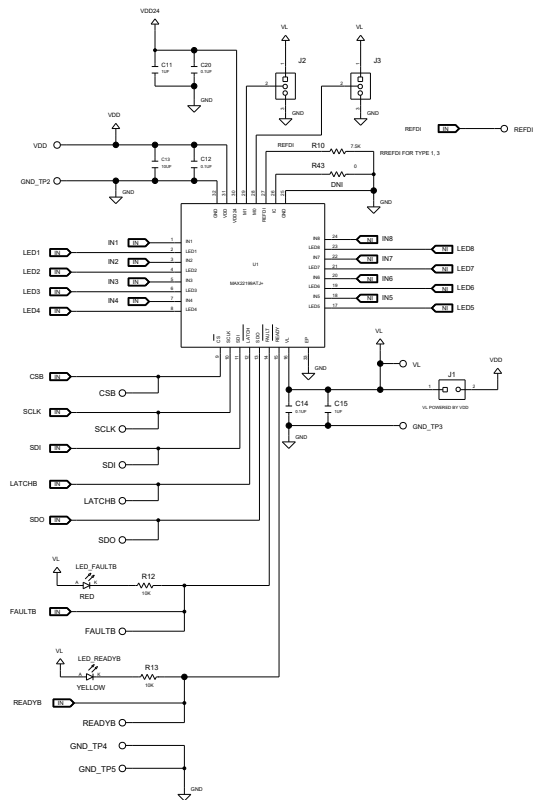
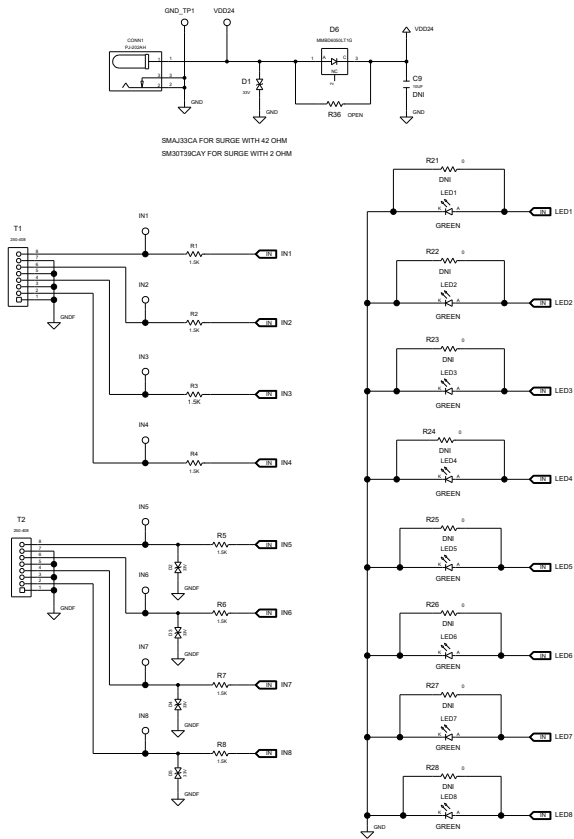
ITEM	REF_DES	DNI/DNP	QTY	MFG PART #	MANUFACTURER	VALUE	DESCRIPTION	COMMENTS
1	3V3_USB, VDD, VDD24, VL	-	4	5010	KEYSTONE	N/A	TEST POINT; PIN DIA=0.125IN; TOTAL LENGTH=0.445IN; BOARD HOLE=0.063IN; RED; PHOSPHOR BRONZE WIRE SIL;	
2	C1, C13, C29	-	3	CL21B106KQNNN; GRM21BZ71C106KE15; GMC21X7R106K16NT	SAMSUNG;MURATA;CAL-CHIP	10UF	CAP; SMT (0805); 10UF; 10%; 16V; X7R; CERAMIC	
3	C2	-	1	C1608X7R1H474K080AC	TDK	0.47UF	CAP; SMT (0603); 0.47UF; 10%; 50V; X7R; CERAMIC	
4	C3	-	1	C1608C0G2A102J080AA; C0603C102J1GAC	TDK;KEMET	1000PF	CAP; SMT (0603); 1000PF; 5%; 100V; C0G; CERAMIC	
5	C4	-	1	C0603C103K2RAC	KEMET	0.01UF	CAP; SMT (0603); 0.01UF; 10%; 200V; X7R; CERAMIC	
6	C5	-	1	C2012X5R1C226K125AC	TDK	22UF	CAP; SMT (0805); 22UF; 10%; 16V; X5R; CERAMIC	
7	C6, C7, C10, C12, C14, C16-C22, C24, C28, C30, C32, C35, C99	-	18	CC0603KRX7R0BB104; GRM188R72A104KA35; HMK107B7104KA; 06031C104KAT2A; GRM188R72A104K	YAGEO;MURATA;TAIYO YUDEN;AVX;MURATA	0.1UF	CAP; SMT (0603); 0.1UF; 10%; 100V; X7R; CERAMIC	
8	C8, C23, C25	-	3	TMK212AB7475K; CGJ4J1X7R1E475K125AC; C2012X7R1E475K125AB; CGA4J1X7R1E475K125AC; GRM21BZ71E475KE15	TAIYO YUDEN;TDK;TDK; TDK;MURATA	4.7UF	CAP; SMT (0805); 4.7UF; 10%; 25V; X7R; CERAMIC	
9	C11	-	1	08051C105K4Z2A	AVX	1UF	CAP; SMT (0805); 1UF; 10%; 100V; X7R; CERAMIC	
10	C15, C31, C36	-	3	UMK107AB7105KA; CC0603KRX7R9BB105	TAIYO YUDEN;YAGEO	1UF	CAP; SMT (0603); 1UF; 10%; 50V; X7R; CERAMIC	
11	C26, C27	-	2	C0603C0G500-180JNE; C1608C0G1H180J080AA; GRM1885C1H180J	VENKEL LTD.;TDK;MURATA	18PF	CAP; SMT (0603); 18PF; 5%; 50V; C0G; CERAMIC	
12	C33	-	1	VJ2220Y332KXUSTX1; GA355QR7GF332KW01	VISHAY VITRAMON;MURATA	3300PF	CAP; SMT (2220); 3300PF; 10%; 250V; X7R; CERAMIC	
13	C34	-	1	VJ2220A102KXUSTX1	VISHAY VITRAMON	1000PF	CAP; SMT (2220); 1000PF; 10%; 250V; C0G; CERAMIC	
14	CONN1	-	1	PJ-202AH	CUI INC.	PJ-202AH	CONNECTOR; MALE; THROUGH HOLE; DC POWER JACK; RIGHT ANGLE; 3PINS	
15	CSB, FAULTB, LATCHB, READYB, REFDI, SCLK, SDI, SDO	-	8	5014	KEYSTONE	N/A	TEST POINT; PIN DIA=0.125IN; TOTAL LENGTH=0.445IN; BOARD HOLE=0.063IN; YELLOW; PHOSPHOR BRONZE WIRE SILVER PLATE FINISH;	
16	D1-D5	-	5	SMAJ33CA	VISHAY GENERAL SEMICONDUCTOR	33V	DIODE; TVS; SMA (DO-214AC); VRM=33V; IPP=7.5A	
17	D6	-	1	MMBD6050LT1G	ON SEMICONDUCTOR	MMBD6050LT1G	DIODE; SWT; SMT (SOT-23); PIV=70V; IF=0.2A	
18	EARTH	-	1	5012	KEYSTONE	N/A	TEST POINT; PIN DIA=0.125IN; TOTAL LENGTH=0.445IN; BOARD HOLE=0.063IN; WHITE; PHOSPHOR BRONZE WIRE SILVER PLATE FINISH;	
19	FIELD_RDY, LED_READYB, LED_USB, LOGIC_RDY	-	4	LTST-C193KSKT-5A	LITE-ON ELECTRONICS INC.	LTST-C193KSKT-5A	DIODE; LED; YELLOW; SMT (0603); VF=2V; IF=0.005A	
20	GND_TP1-GND_TP5, UGND	-	6	5011	KEYSTONE	N/A	TEST POINT; PIN DIA=0.125IN; TOTAL LENGTH=0.445IN; BOARD HOLE=0.063IN; BLACK; PHOSPHOR BRONZE WIRE SILVER PLATE FINISH;	
21	IN1-IN8	-	8	5013	KEYSTONE	N/A	TEST POINT; PIN DIA=0.125IN; TOTAL LENGTH=0.445IN; BOARD HOLE=0.063IN; ORANGE; PHOSPHOR BRONZE WIRE SILVER PLATE FINISH;	
22	J1	-	1	PCC02SAAN	SULLINS	PCC02SAAN	CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT THROUGH; 2PINS; -65 DEGC TO +125 DEGC	
23	J2, J3	-	2	PCC03SAAN	SULLINS	PCC03SAAN	CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT THROUGH; 3PINS; -65 DEGC TO +125 DEGC	
24	L1, L3, L4	-	3	BLM21PG331SN1	MURATA	330	INDUCTOR; SMT (0805); FERRITE-BEAD; 330; TOL=+/-25%; 1.5A	
25	L2	-	1	B82432T1332K000	TDK	3.3UH	INDUCTOR; SMT (1812); FERRITE CORE; 3.3UH; TOL=+/-10%; 0.9A	
26	LED1-LED8	-	8	LTST-C193KGKT-5A	LITE-ON ELECTRONICS INC.	LTST-C193KGKT-5A	DIODE; LED; STANDARD; YELLOW-GREEN; SMT (0603); PIV=1.9V; IF=0.005A; -55 DEGC TO +85 DEGC	

MAX22199 EV Kit Bill of Materials (continued)

ITEM	REF_DES	DN/DNP	QTY	MFG PART #	MANUFACTURER	VALUE	DESCRIPTION	COMMENTS
27	LED_FAULTB	-	1	LTST-C193KRKT-2A	LITE-ON ELECTRONICS INC.	LTST-C193KRKT-2A	DIODE, LED; EXTRA THIN; EXTRA BRIGHT; RED; SMT (0603); VF=2.2V; IF=0.002A	
28	MTH1-MTH4	-	4	9032	KEYSTONE	9032	MACHINE FABRICATED; ROUND-THRU HOLE SPACER; NO THREAD; M3.5; 5/8IN; NYLON	
29	PMOD1	-	1	TSW-106-08-S-D-RA	SAMTEC	TSW-106-08-S-D-RA	CONNECTOR; THROUGH HOLE; DOUBLE ROW; RIGH	
30	R1-R4	-	4	RPC2512JT1K50	STACKPOLE ELECTRONICS INC.	1.5K	RES; SMT (2512); 1.5K; 5%; +/-100PPM/DEGC; 1.5000W;	
31	R5-R8	-	4	CRCW06031K50FK	VISHAY DALE	1.5K	RES; SMT (0603); 1.5K; 1%; +/-100PPM/DEGC; 0.1000W	
32	R9	-	1	CRCW0603100RFK; ERJ-3EKF1000; RC0603FR-07100RL	VISHAY DALE;PANASONIC	100	RES; SMT (0603); 100; 1%; +/-100PPM/DEGC; 0.1000W	
33	R10	-	1	ERJ-3EKF7501; CRCW06037K50FK	PANASONIC;VISHAY	7.5K	RES; SMT (0603); 7.5K; 1%; +/-100PPM/DEGC; 0.1000W	
34	R11, R14	-	2	CRCW060310R0FK; MCR03EZPFX10R0; ERJ-3EKF10R0	VISHAY DALE;ROHM	10	RES; SMT (0603); 10; 1%; +/-100PPM/DEGC; 0.1000W	
35	R12, R13, R15, R17, R37, R40-R42	-	8	CRCW060310K0FK; ERJ-3EKF1002; AC0603FR-0710KL; RMCF0603F10K0	VISHAY DALE; PANASONIC;YAGEO	10K	RES; SMT (0603); 10K; 1%; +/-100PPM/DEGC; 0.1000W	
36	R16	-	1	CRCW06032K20FK	VISHAY DALE	2.2K	RES; SMT (0603); 2.2K; 1%; +/-100PPM/DEGC; 0.1000W	
37	R18	-	1	CRCW060315K0FK	VISHAY DALE	15K	RES; SMT (0603); 15K; 1%; +/-100PPM/DEGC; 0.1000W	
38	R19	-	1	CRCW060312K0FK	VISHAY DALE	12K	RES; SMT (0603); 12K; 1%; +/-100PPM/DEGC; 0.1000W	
39	R29-R35	-	7	CRCW060320R0FK; ERJ-3EKF20R0	VISHAY DALE;PANASONIC	20	RES; SMT (0603); 20; 1%; +/-100PPM/DEGC; 0.1000W	
40	R39	-	1	CRCW0603100KFK; RC0603FR-07100KL; RC0603FR-13100KL; ERJ-3EKF1003; AC0603FR-07100KL	VISHAY DALE;YAGEO; YAGEO;PANASONIC	100K	RES; SMT (0603); 100K; 1%; +/-100PPM/DEGC; 0.1000W	
41	SU1-SU3	-	3	S1100-B;SX1100-B; STC02SYAN	KYCON;KYCON; SULLINS ELECTRONICS CORP.	SX1100-B	TEST POINT; JUMPER; STR; TOTAL LENGTH=0.24IN; BLACK; INSULATION=PBT;PHOSPHOR BRONZE CONTACT=GOLD PLATED	
42	SW1	-	1	219-7MST	CTS	219-7MST	SWITCH; SPST; SMT; STRAIGHT; 20V; 0.1A; SURFACE MOUNT DIP SWITCH-AUTO PLACEABLE; RINSULATION=1000M OHM	
43	T1, T2	-	2	250-408	WAGO	250-408	CONNECTOR; FEMALE; THROUGH HOLE; COMPACT TERMINAL STRIP WITH PUSH BUTTON; STRAIGHT; 8PINS	
44	U1	-	1	MAX22199ATJ+	MAXIM	MAX22199ATJ+	EVKIT PART - IC; RV49A-1A; PACKAGE CODE: T3255+6; PACKAGE OUTLINE: 21-0140; PACKAGE LAND PATTERN: 90-0603; TQFN32-EP	
45	U2	-	1	MAX1556ETB+	MAXIM	MAX1556ETB+	IC; CONV; PWM STEP-DOWN DC-DC CONVERTER; TDFN10-EP 3X3	
46	U3	-	1	93LC66BT-I/OT	MICROCHIP	93LC66BT-I/OT	IC; EPROM; 4K MICROWIRE SERIAL EEPROM; SOT23-6	
47	U4	-	1	FT2232HQ	FUTURE TECHNOLOGY DEVICES INTL LTD.	FT2232HQ	IC; MMRY; DUAL HIGH SPEED USB TO MULTIPURPOSE UART/FIFO; QFN64-EP	
48	U5	-	1	MAX14483AAP+	MAXIM	MAX14483AAP+	IC; DISO; 6-CHANNEL; LOW-POWER; 3.75KVRMS SPI DIGITAL ISOLATOR; SSOP20	
49	X1	-	1	ZX62RD-AB-5P8(30)	HIROSE ELECTRIC CO LTD.	ZX62RD-AB-5P8(30)	CONNECTOR; MALE; THROUGH HOLE; MICRO-USB CONNECTOR MEETING REQUIREMENTS OF USB 2.0 STANDARD; RIGHT ANGLE; 5PINS	
50	Y1	-	1	ABM7-12.000MHZ-D2Y-T	ABRACON	12MHZ	CRYSTAL; SMT; 12MHZ; 18PF; TOL = +/-20PPM; STABILITY = +/-30PPM	
51	PCB	-	1	MAX22199	MAXIM	PCB	PCB:MAX22199	-
52	C9	DNP	0	GRM32EC72A106KE05	MURATA	10UF	CAP; SMT (1210); 10UF; 10%; 100V; X7S; CERAMIC	
53	R21-R28, R43	DNP	0	CRCW06030000ZS; MCR03EZPJ000; ERJ-3GEY0R00; CR0603AJJ-000ELF	VISHAY;ROHM SEMICONDUCTOR; PANASONIC;BOURNS	0	RES; SMT (0603); 0; JUMPER; JUMPER; 0.1000W	
54	R38	DNP	0	CRCW25120000Z0EGHP	VISHAY DRALORIC	0	RES; SMT (2512); 0; JUMPER; JUMPER; 1.5000W	
55	R20, R36	DNP	0	N/A	N/A	OPEN	PACKAGE OUTLINE 0603 RESISTOR	
TOTAL			140					

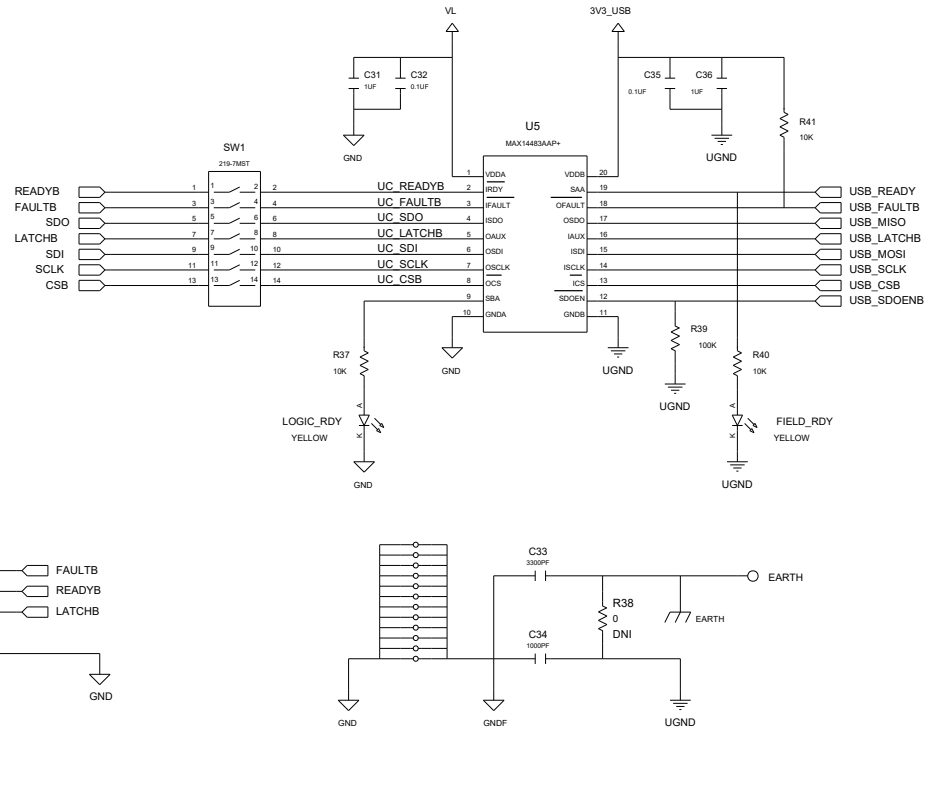
MAX22199 EV Kit Schematics

DI TYPE 1, 3 CONFIGURATION



MAX22199 EV Kit Schematics (continued)

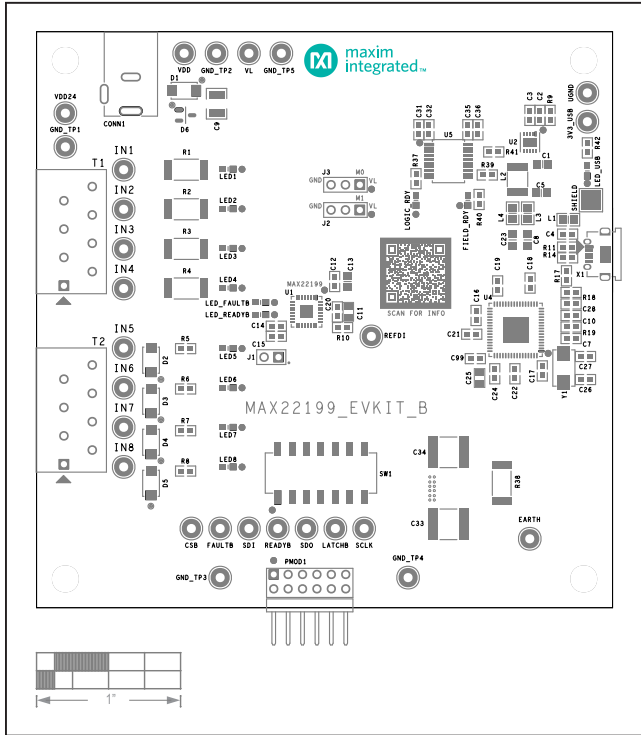
DIGITAL ISOLATION



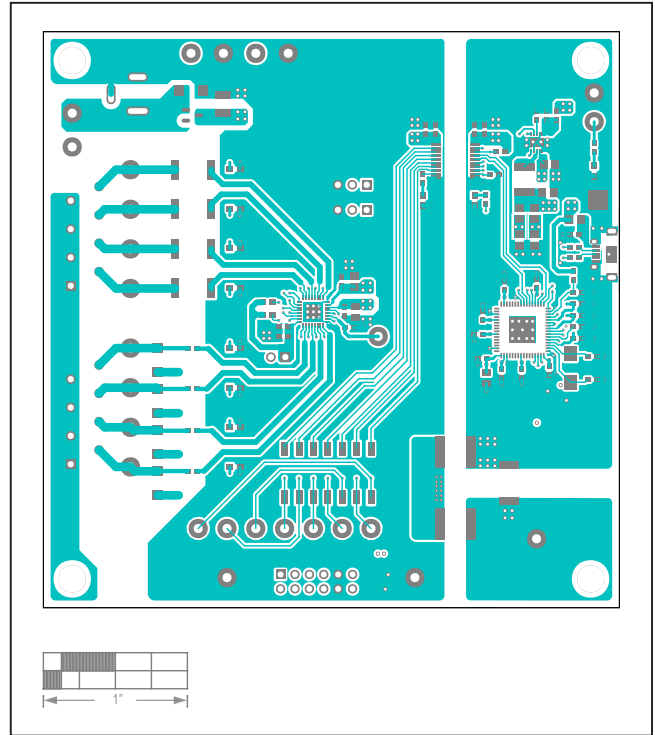




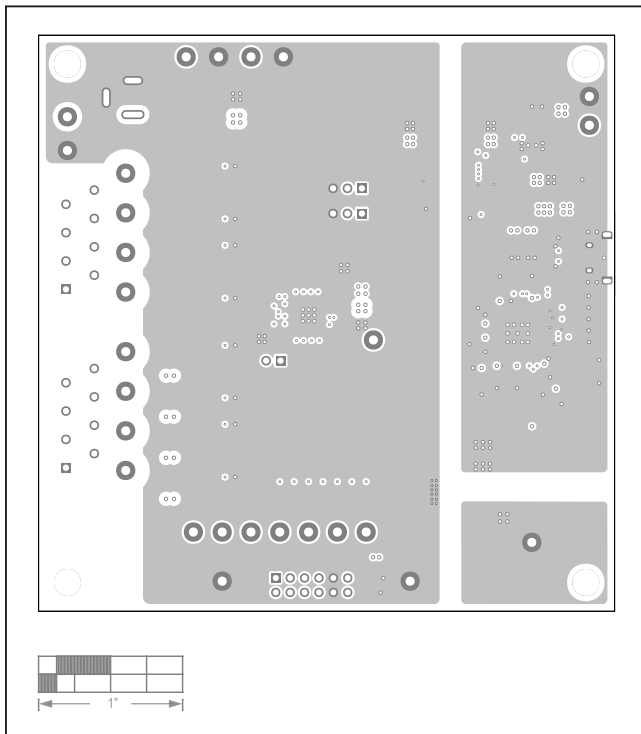
MAX22199 EV Kit PCB Layout



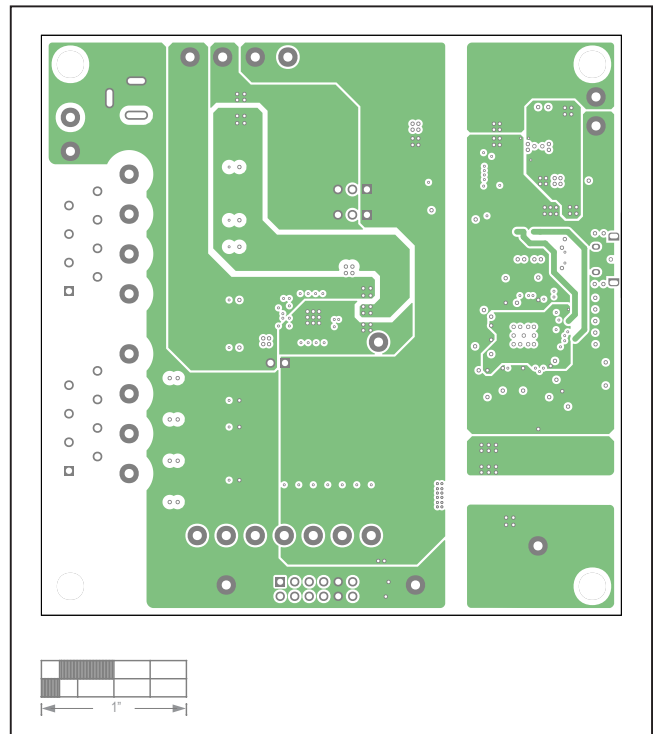
MAX22199 EV Kit PCB Layout—Top Silkscreen



MAX22199 EV Kit PCB Layout—Top



MAX22199 EV Kit PCB Layout—Internal 2



MAX22199 EV Kit PCB Layout—Internal 3



Revision History

REVISION NUMBER	REVISION DATE	DESCRIPTION	PAGES CHANGED
0	10/21	Release for Market Intro	—



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